

OBJECTIVE

Quantitative Strategist/Portfolio Manager

EXPERTISE

Quantitative trading strategies: Statistical Arbitrage, Market Microstructure, Forecasting Techniques. Algorithmic trading; Design and development using time series methods, statistical machine learning, digital signal processing and optimization methods; Mathematical language environments: R, S-PLUS; Maple, OOD and parallel processing in C++, Java; RDB and KDB design, development, FIX, International equity markets;

EXPERIENCE

October 2012 – December 2012, Buttonwood Group, Chicago

- Deployed and readied for production strategy Malachite, described below.

October 2011 – August 2012, Independent work, IVC

- Implemented a set of statistical US equity strategies over high and medium frequencies (Malachite).
- Strategies trade 300 of the most liquid equities and ETFs with average ADV of about 175MM.
- Medium frequency average holding period is 12 hours, daily Sharpe 5.2, return 13bps / day with capacity of approximately 500MM using all aggressive execution.
- Strategy gains edge via the use of original sophisticated statistical methods capturing relative market dynamics.
- Extensively studied strategy execution aspects on lit venues for a range of time horizons.

Nov 2009 – October, 2011 Tower Research Capital, LLC (NYC)

Quantitative Strategist

- Created an alpha model for a live high P&L and Sharpe ratio trading high frequency strategy applicable to spot FX, US and European futures.
- Managed optimal portfolio management and allocation across multiple sources of alpha.
- During the first year, live traded and implemented a high frequency trading strategy applicable to trading spot FX with a high daily Sharpe ratio and P&L.
- Developed and applied a scalable and fully automated multistage statistical forecasting and trading framework as a distributed system over multiple Linux machines using R, C++ and shell scripts.
- Developed an extensive set of highly predictive market microstructure indicators with great focus on queue position modeling. This was successfully done both for order and level based data feeds from various ECNs/exchanges.
- Designed a stochastic control framework with applications to market making, in broad sense, allowing the seamless combination and efficient optimization of prediction and trading models as a whole.
- Successfully applied a large number of statistical machine learning, advanced signal processing, multivariate statistical and econometric methods to real trading.
- End-to-end hands-on implementation of execution strategies and alpha generation. Extensive use of R with a number of cutting edge statistical packages and efficient C++ coding, parallel computation on large Linux server farms.

2004 – 2009 BNY Convergenx Group, LLC, NYC

Quantitative Developer / Project Manager, VP

- *Statistical Arbitrage*: designed and implemented a co-integration and vector error correction model

for multi-asset portfolios.

- *Trading Profit Optimization*: invented, designed and implemented a system allowing to meet precise price benchmark requirements on a portfolio level. This resulted in a considerable trading revenue increase.
- *Market Impact Forecasting and Measurement*: designed, calibrated and implemented equity market impact model based on a multifactor portfolio model making essential improvements to R. Almgren design, whereby a significant source of estimation bias was eliminated.
- *Portfolio Risk Model*: designed and developed multifactor portfolio risk model for domestic and international markets and implemented within the optimal portfolio execution algorithm. Implemented a highly parallel clustering algorithm for the determination of market factors in C++.
- *Optimal Portfolio Execution Algorithm*: crucially contributed to an analytical model design and filed a patent for this model. This included expanding on theoretical framework of R. Almgren, R. Kissel and others by enabling real-time optimization capability for the algorithm via the derivation of a certain closed form analytical utility function for a continuous time stochastic process.
- *Short Term Alpha Model*: designed and prototyped a generic Trade Tactics model capable of automatically capturing statistically significant relationships between short term market characteristics in a market segment. This method maximizes the implementation shortfall metric, thus achieving the best price for a given risk aversion level resulting in 30%+ of spread cost average price improvement. The algorithm makes use of statistical machine learning. Implemented in native C++.
- *Advanced Pre-Trade Analysis*: designed and implemented advanced portfolio pre-trade analysis model which had significant advantage over regular models, e.g. R. Kissel, by accounting for serial correlations in both Liquidity and Portfolio risk estimation.
- *Agency Strategy Suite*: implemented a number of trading strategies for the international markets such as basic VWAP, TWAP, POV, Peg and more advanced ones such as Implementation Shortfall, using optimal trading framework, and enhancing R. Almgren design by using more accurate impact functions.
- Responsible for the algorithmic trading proprietary system for the international equity markets.
- Global equity marketplace algorithmic trade analysis for the market phases, trade conditions and optimal order types.

2000–2004 BNY Securities, NYC

Trading Systems Architect (VP), Project Manager

- Designed and implemented multi-location global portfolio trading system from ground up, directly working with business groups. The system performs three main functions: global order flow management, multi-location trader collaboration and FIX electronic trading. Built in Java/Corba/Weblogic J2EE with the database in MS SQL, running on 64 bit Itanium and Opteron servers.
- Executed high level and detailed object and relational database technical design, architecture, business analysis, specifications, development.
- Ran a group of 7+ full-time developers reporting to myself involved in development and QA functions.
- “Ran” the system on day-to-day basis.
- Performed hands-on development in MS SQL, Java/J2EE, VC++, .NET C#/VB

1998–2000 Dresdner Kleinwort Benson, NYC

Project lead/Senior Analyst/Developer

- Responsible for NY node of international equity basket trading system. The system was supporting multi-office principal/agency portfolio trading. Implemented under HPUX and Windows using Sybase/C++/VC++/Corba

- Designed and implemented generic MIS subsystem, electronic feeds to ITG for trading and ADP for back office settlements as well as a number of Web, Excel and system interfaces using Sybase/VC++/Perl/VBA.

1996-1998 Barclays Capital (former BZW), NYC

Project lead/Senior Analyst/Developer

- Designed, implemented and supported global collateral management system for MMFX (money market & foreign exchange) as well as derivatives, primarily Swaps. System built in VC++/Sybase using Bloomberg pricing feed.
- Designed and implemented middle office reconciliation system for fixed income derivatives under VC++/VBA

1995-1996 *Programmer/Analyst* at Midas Kapiti (Financial systems), Russ Berry, Avon Products in NY/NJ area.

1994-1995 *Researcher at the Institute of Mathematics*, Ural branch, Russia.

PhD thesis in Multivariate Complex Analysis.- **“Surjectivity of convolution type operator – division theorem on algebraic manifolds”** This was an open problem in the field which thwarted solution efforts for over 10 years undertaken by some of the most seasoned researchers. A solution was found independently by myself in approximately 18 months.

1989-1994 *Bashkir State University, Russia*

B.S and M.S. in Mathematics, specializing in Complex and Functional Analysis. Grades equivalent to US GPA 4.0

QUANTITATIVE AND ECONOMETRIC METHODS

- Multivariate statistics, Principal Component Analysis (PCA), Kernel PCA and Independent Component Analysis(ICA)
- Stochastic Control and Stochastic Calculus.
- DSP, Adaptive filtering, Kalman filters, Hidden Markov Model
- Kernel Methods, Support Vector Machines
- Cointegration and Error Correction models, Vector Auto Regression, ARCH and Granger causality, GARCH models, ARIMA. Panel data modeling: Fixed and Variable effects models
- MARS, Boosting methods, Regression trees, Cluster analysis: Markovian (MCL), spectral and K-means clustering.
- Standard ANOVA techniques, shrinkage methods, GLS, GLM models.
- Complexity theory, combinatorial optimization methods
- Optimization methods: Linear (LP), Quadratic (QP), Convex and Semi-Definite programming (SDP)
- Strong general mathematical foundations in multivariate complex analysis, functional analysis, differential equations, probability and general statistics among many other graduate level areas.

PATENTS

- ***Optimal portfolio trading strategy (co-author, patent pending since May 2008)***
- ***Bounded Time Boolean Satisfiability Solver (patent pending since Feb 2006) – a universal combinatorial optimization solver***
- ***Almost Independent Logically Integrated License Enforcement Framework (patent pending since Dec 2002) – a universal software copy protection system***

